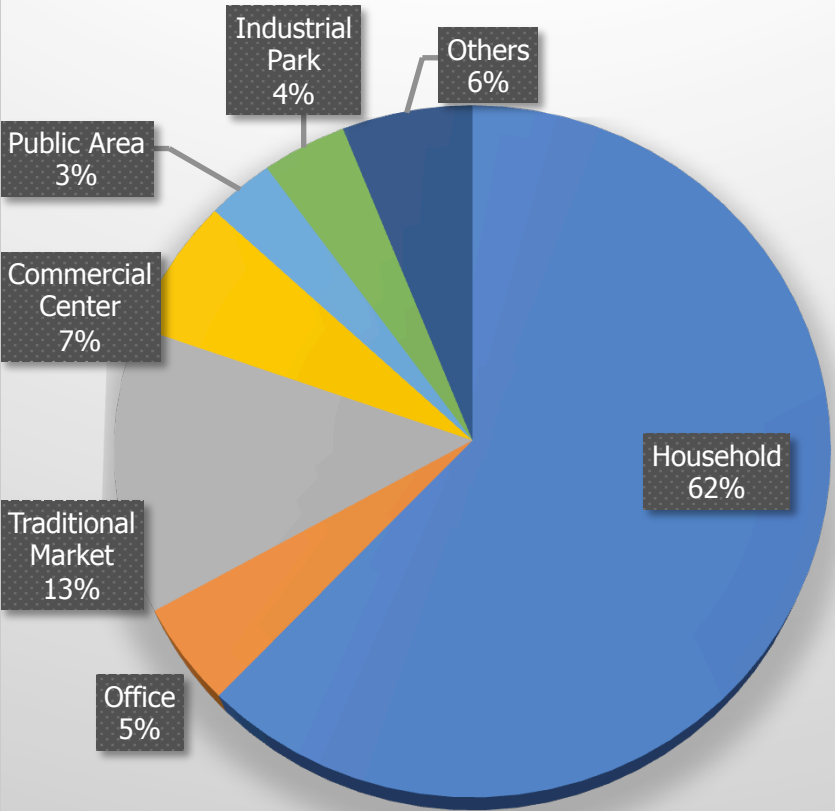




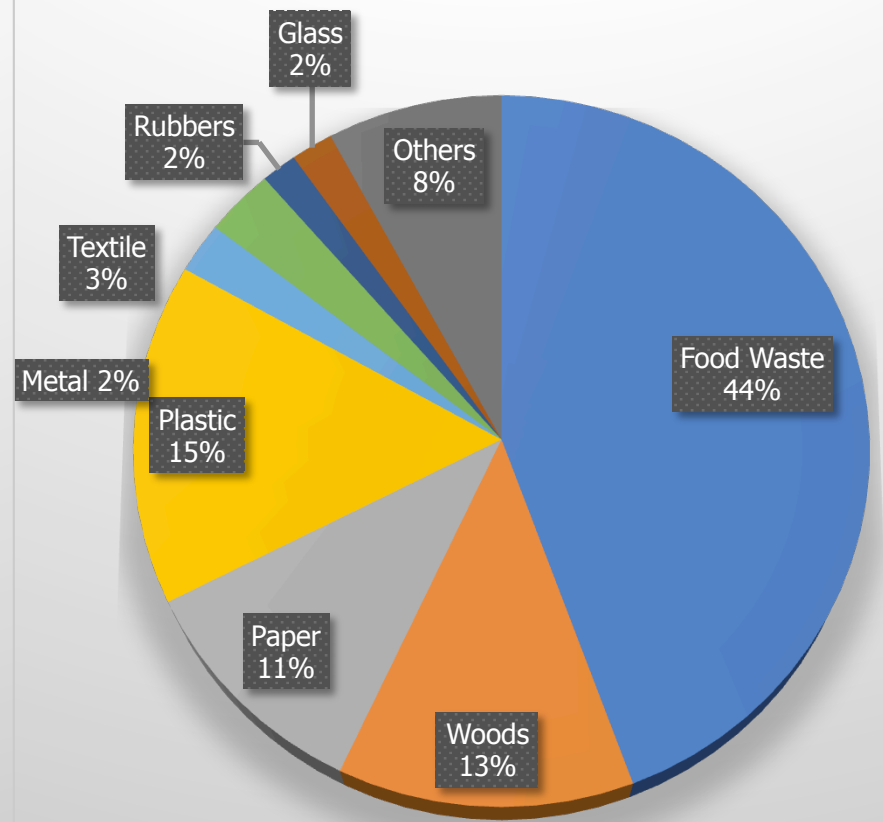
## IMPORTANCE OF SUSTAINABLE RECOVERY: SOLID WASTE MANAGEMENT DURING PANDEMIC COVID-19

SINTA SAPTARINA SOEMIARNO  
DIRECTOR OF PERFORMANCE EVALUATION ON HAZARDOUS WASTE AND NON HAZARDOUS WASTE MANAGEMENT  
MINISTRY OF ENVIRONMENT AND FORESTRY  
JAKARTA, 14 JANUARY 2021

# MUNICIPAL SOLID WASTE GENERATION DATA IN INDONESIA 2019



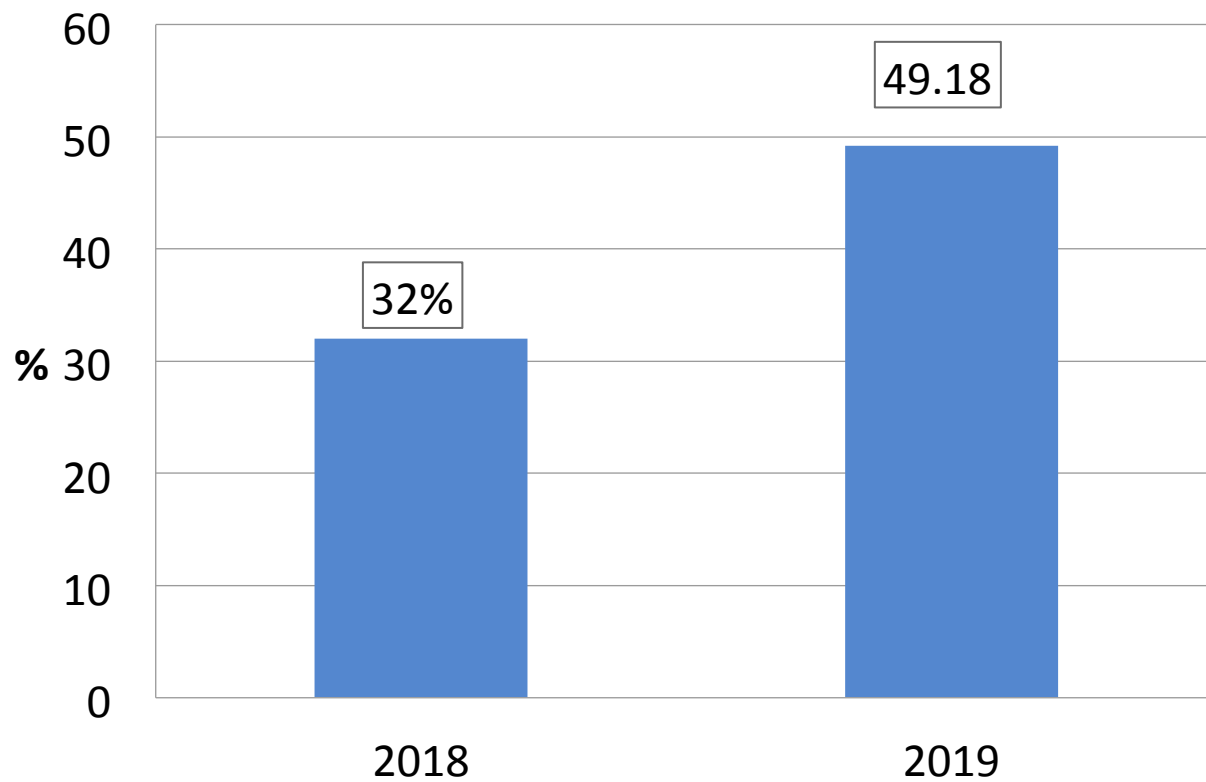
SOURCE WASTE GENERATION



WASTE TYPE COMPOSITION

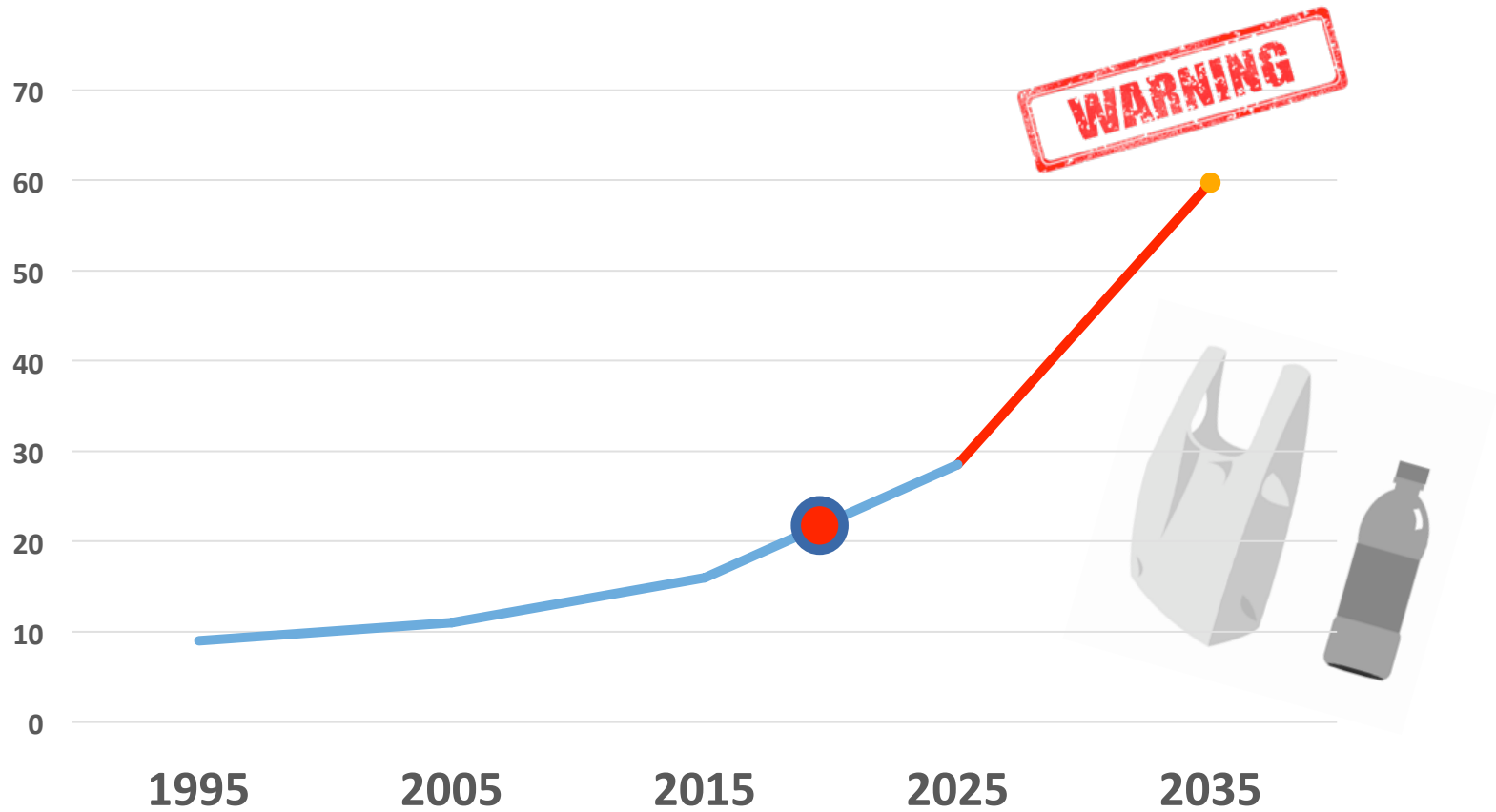


# PROPER WASTE MANAGEMENT IN INDONESIA





# TREND PERCENTAGE OF PLASTIC WASTE COMPOSITION





# KEY PERFORMANCE INDICATOR (KPI)

## 2019

- Waste Management Capacity **32 %**
  - Reduction **3%**
  - Handling **29%**
- Reduction of Plastic Waste into Sea (**0.25-0.59** million ton/year)
- Index of Unawareness **0.72**
- Percentage of people Sorting Out **11%**
- *Recycling Rate* **11-13%**
- PSEL (Conversion of Waste into electrical energy) = **0 City**

## Target 2025

- Waste Management Capacity **100%**
  - Reduction **30%**
  - Handling **70%**
- Reduction Of Plastic Waste Into Sea (**0.075-0.18** Million ton/year)
- Index of Unawareness **0.30**
- Percentage of people sorting out **50%**
- *Recycling Rate* **50%**
- PSEL (Conversion of Waste into electrical energy) = **12 Cities**



# POLICIES APPROACH ON SOLID WASTE MANAGEMENT

Act No.18 Year 2018 regarding Solid Waste Management

Government Regulation No. 81 Year 2012 regarding Solid Waste Management from Household and Household-Liked Waste

Government Regulation No. 27 Year 2020 regarding Specific Waste Management

Presidential Decree No 97/2017 regarding Policies & Strategies on SWM from Household & Household-Liked Waste (Jakstranas)

Presidential Decree No. 83 Year 2018 regarding Marine Litter Management

## UP-STREAM

- RPP Cukai Kantong Plastik
- Permen LHK 75/2019: Road Map Producers
- Mayor/Local Government Regulation on Reducing Waste

PRODUCER

- Peraturan Menteri No. 13/2012: 3R on Waste Bank
- Agreement 3 Ministries and Head of National Police (Road Map on Domestic Resources)

PUBLIC/COMMUNITIES

## DOWN STREAM

- Perpres 35/2019: WtE Plant
- Permen LHK 10/2018: Jakstrada
- Permen LHK 24/2019: BLPS
- Permen LHK 76/ 2019: Clean City Program
- Others Ministries regulations

LOCAL GOV



## Purpose of Policy

## Target

## Program

WASTE REDUCTION

REDUCTION BY 30% IN 2025 FROM NATIONAL WASTE GENERATION

1. LIMITATION OF WASTE GENERATION
2. WASTE RECYCLING
3. REUSE OF WASTE

WASTE MANAGEMENT

MANAGED BY 70% IN 2025 FROM NATIONAL WASTE GENERATION

1. SORT
2. COLLECTION
3. TRANSPORTATION
4. PROCESSING
5. FINAL PROCESSING

THE BASIC PRINCIPLE OF JAKSTRANAS IS **WASTE REDUCTION AT THE SOURCE**, IT SHOW A STRONG COMMITMENT TO INVOLVE COMMUNITY TO MAKE CHANGE OF BEHAVIOUR DAN CULTURE AND MAKE IT BECOME **COMMUNITY MOVEMENT**

1. REDUCTION PROGRAM
2. HANDLING PROGRAM

1. REDUCTION STRATEGY
2. HANDLING STRATEGY

# POLICIES OF HAZARDOUS WASTE MANAGEMENT FROM HEALTH SERVICE FACILITIES

**UU** Act No 32 year 2009 Environmental Protection and Management

**PP** Government Regulation nomor 101 tahun 2014 : Hazardous Waste Management

**PERMEN** Ministerial Decree no 56 year 2015: Procedures and Technical Guidance for the Hazardous Waste Management from Health Facilities

KODE INDUSTRI/KEGIATAN	JENIS INDUSTRI/KEGIATAN	SUMBER LIMBAH	KODE LIMBAH	URAIAN LIMBAH	KATEGORI BAHAYA
		produksi farmasi		dan reaksi	
			A336-4	Reactor bottom wastes	1
			A336-5	Sludge dari fasilitas produksi	1
			B336-1	Absorban dan filter bekas (karbon aktif)	2
			A336-2	Sludge dari IPAL	2
37	RUMAH SAKIT DAN FASILITAS PELAYANAN KESEHATAN	1. Seluruh rumah sakit dan laboratorium klinis 2. Fasilitas insinerator 3. IPAL yang mengolah effluen dari kegiatan rumah sakit dan laboratorium klinis	A337-1	Limbah klinis memiliki karakteristik infeksius	1
			A337-2	Produk farmasi kadaluwarsa	1
			A337-3	Bahan kimia kadaluwarsa	1
			A337-4	Peralatan laboratorium terkontaminasi B3	1
			A337-5	Peralatan medis mengandung logam berat, termasuk merkuri (Hg), kadmium (Cd), dll	1
			B337-1	Kemasan produk farmasi	2
			B337-2	...	2

1. Limbah dengan karakteristik infeksius

2. Limbah benda tajam

3. Limbah patologis

4. Limbah bahan kimia kadaluwarsa, tumpahan, atau sisa kemasan

5. Limbah radioaktif

6. Limbah sitotoksik

7. Limbah farmasi

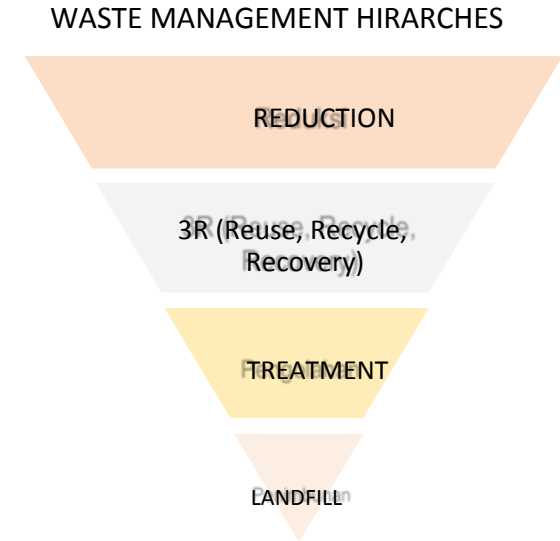
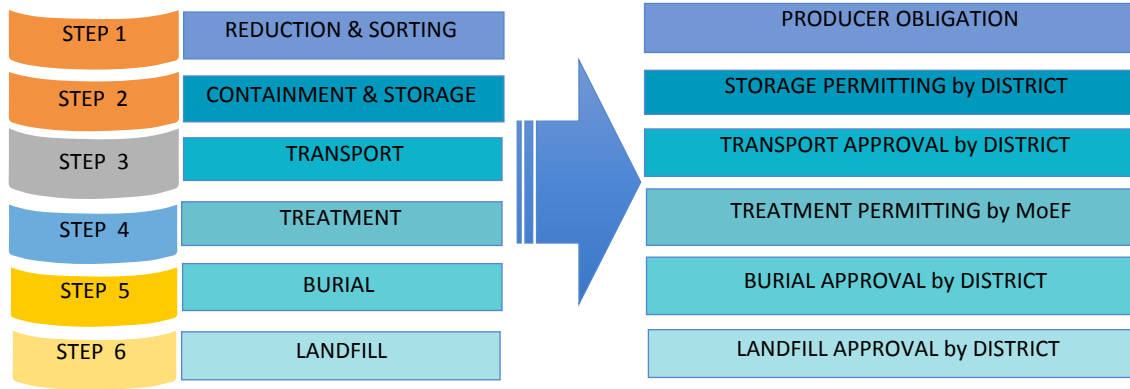
8. Limbah peralatan medis yang memiliki kandungan logam berat tinggi

9. Limbah tabung gas/kontainer bertekanan



# MEDICAL WASTE MANAGEMENT STAGES

## MINISTRY OF ENVIRONMENT AND FORESTRY DECREE NO P-56 YEAR 2015



### NON HAZARDOUS WASTE:

- by emptying, cleaning, disinfecting, shredding
- used packaging, used syringes, food infusion bottles, used hemodialysis fluid packaging



Pasal 38

(1) Kewajiban memiliki Izin Pengelolaan Limbah B3 untuk kegiatan Pengelolaan Limbah B3 dikecualikan untuk Penghasil Limbah B3 yang melakukan sendiri Pengelolaan Limbah B3 berupa:

- keemasan bekas B3;
- sprit bekas;
- botal infus bekas selain infus darah dan/atau cairan tubuh; dan/atau
- bekas kemasan cairan hemodialisis.

(2) Pengelolaan Limbah B3 sebagaimana dimaksud pada ayat (1) dilakukan melalui:

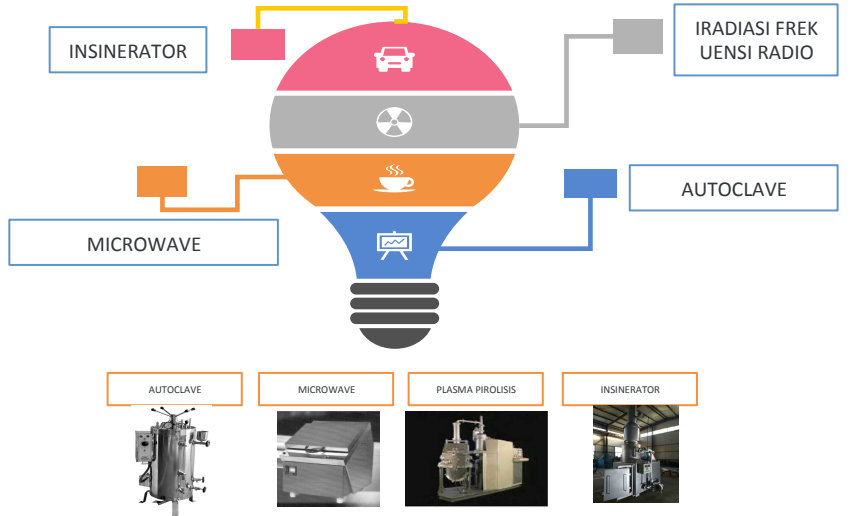
- pengosongan;
- pembersihan;
- desinfeksi; dan
- penghancuran atau pencacahan.



# TREATMENT OF MEDICAL WASTE

MINISTRY OF ENVIRONMENT AND FORESTRY DECREE NO P-56 YEAR 2015 (ARTICLE 17 – 24)

## THERMAL



## NON THERMAL

- CHEMICAL DISINFECTION
- BIOLOGICAL PROCESS
- ENCAPSULATION/INERTISATION

## REQUIREMENT

NO.	JENIS PERALATAN	LOKASI	JENIS LIMBAH
1.	Autoclave tipe alir gravitasi dan/atau Tipe Vakum	1. Daerah bebas banjir 2. Tidak rawan bencana alam atau dapat direkayasa dengan teknologi 3. Jarak dengan lokasi fasilitas umum diatur dalam Izin Lingkungan	Limbah infeksius dan benda tajam, peralatan medis
2.	Gelombang Mikro		Limbah infeksius dan benda tajam, tabung gas
3.	Iradiasi Frekuensi Radio		Limbah infeksius, benda tajam, peralatan
4.	Insinerator	1. Daerah bebas banjir 2. Tidak rawan bencana alam atau dapat direkayasa dengan teknologi 3. Jarak paling dekat 30 m dengan: <ol style="list-style-type: none"> <li>lokasi fasilitas jalan umum,</li> <li>jalan tol, daerah permukiman, perdagangan, hotel, restoran, keagamaan, pendidikan</li> <li>Garis pasang naik laut, sungai, daerah pasang surut, kolam, danau, rawa, mata air, sumur penduduk</li> <li>Daerah cagar alam, hutan lindung, daerah yg dilindungi</li> </ol> kecuali di dalam kawasan industri	Dilarang untuk limbah radioaktif, mudah meledak, mengandung merkuri



# TYPES OF TECHNOLOGY VS TYPES OF WASTE

TIPE	INFEKSIUS	SHARP	PHATOLOGY	PHARMACY	GENOTOXIC	RADIOACTIVE
INCINERATOR	√	√	√	√	√	x
AUTOCLAVE	√	√	x	x	x	x
MICROWAVE	√	√	x	x	x	x
PLASMA PIROLISIS	√	√	√	√	√	√
LANDFILL	√	√	x	x	x	x

Insinerator



Autoclave



Microwave



Plasma Pirolisis



Landfill





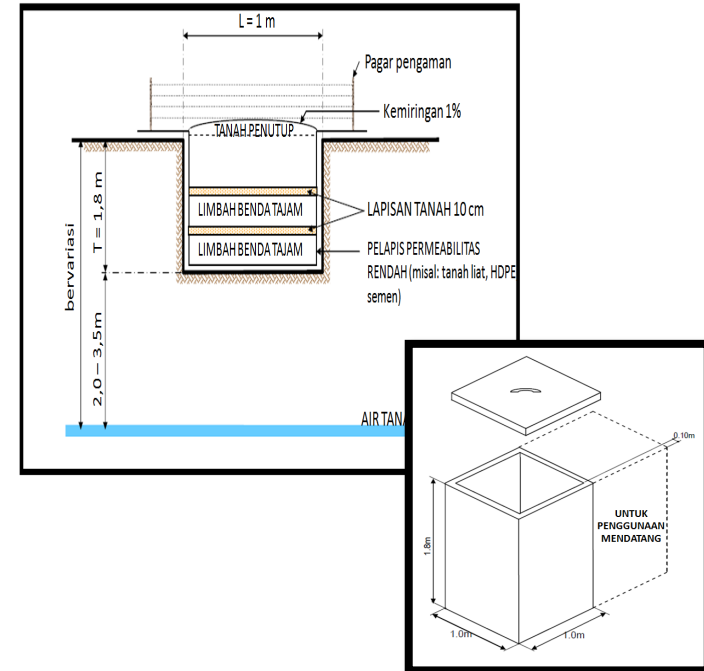
# BURIAL TREATMENT

MINISTRY OF ENVIRONMENT AND FORESTRY DECREE NO P-56 YEAR 2015 (ARTICLE 8 – ATTACHMENT III)

## REQUIREMENTS

LOKASI	TEKNIS OPERASI	JENIS LIMBAH	IZIN
1. Daerah bebas banjir	1. Isi $\frac{1}{2}$ dari volume	PHATOLOGY AND SHARP	Persetujuan Dinas LH setempat
2. Berjarak $\geq 20m$ dari sumur/perumahan	2. Ditutup kapur tebal 50 cm	<b>ONLY DURING PANDEMIC: INFECTIOUS WASTE</b>	
3. Kedalaman $\geq 1,8 m$	3. Sekat tanah tebal $\geq 10 cm$		
4. Diberi pagar dan papan penanda	4. Melakukan pencatatan		
	5. Melakukan perawatan dan pengawasan		

## BURIAL TREATMENT






# Solid and Hazardous Waste Management During Pandemic COVID-19

HEALTH FACILITIES (HOSPITAL, CLINICS, PUSKESMAS, LABORATORIUM, ETC)

**DAFTAR 100 RUMAH SAKIT BERSIUKAN PENANGANAN VIRUS CORONA**



HOUSEHOLD / PUBLIC AREA



**INFECTIOUS WASTE**  
(Hazardous waste) from  
Corona Virus Diseases  
Handling





# DOMESTIC WASTE AMOUNT

## Decreasing waste amount in commuter cities 10-15%, such as:

- Jakarta 620 tons/day
- Surabaya 310 tons/day
- Bukittinggi almost 20 %

## Decreasing waste amount in non commuter cities 1-3%, such as:

- Balikpapan 20,67 tons/day
- Bogor 10-15 tons/day
- Bandung 0,7 %

*This condition triggered by decreasing commercial activities. Meanwhile in the contrary increasing domestic activities related to policy of Work From Home/Study From Home*



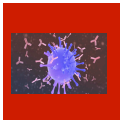
# WASTE DURING PANDEMIC COVID-19



27 - 36% extra waste from online shopping packaging such as: single use plastic packaging, *stryrofoam* and box/cardboard



increasing household waste due to work from home, school from home activities



Increasing infectious waste  $\pm$  30% (on going)



Decreasing amount of waste from commercial sector (ex: office, shopping center, etc)



# MOEF RESPONSES DURING PANDEMIC COVID-19

**28 Januari 2020**

Head of National Disaster Management Authority  
y Decree (BNPB)  
No. 9A/2020 on Determination of the Status of C  
ertain Disaster Emergency Situations for Corona  
Virus Outbreaks in Indonesia

**24 Maret 2020**

Minister of Env and Forestry Number 2/2020  
concerning Management of Infectious Waste and Hous  
ehold Waste from Handling Corona Virus  
Disease (Covid-19)

**30 Maret 2020**

Director General of Solid Waste, Hazardous  
Waste and Hazardous Substances Management  
number 156/2020 to Hazardous Waste Managers  
Regarding Support for Handling COVID-19  
Infusion Waste

Handling Infectious Waste from Medi  
cal Treatment Facilities

Handling Infectious Waste from susp  
ect at Household

Handling domestic waste manage  
ment from household and waste-liked h  
ousehold

# HANDLING DOMESTIC WASTE FROM HOUSEHOLD

## #1 Limbah Masker Sekali Pakai dari Sampah Rumah Tangga



Lipat masker bekas menjadi 2 bagian (sisi dalam masker tetap berada dibagian dalam)



Gulung & ikat masker bekas dengan tali pengikatnya



Bungkus masker bekas dengan tisu atau kertas



Robek / potong masker bekas menjadi 2 bagian



Kumpulkan sampah masker dalam satu kantong, ikat rapat & **JANGAN** satukan sampah masker dengan sampah rumah tangga



Buang sampah masker ke tempat khusus masker yang disediakan di ruang publik

Bagi kalian yang sehat dapat gunakan masker guna ulang untuk mengurangi penumpukan sampah

## Domestic Waste

Handling domestic waste management from household and waste-liked household

- Reuseable Personal Protective equipments (PPE)
- Disposable mask handling is required for tearing, cutting / cutting
- Neatly packed and then disposed of in the trash



# HANDLING INFECTIOUS WASTE FROM HOUSEHOLD

## Infectious Waste



### Handling Infectious Waste from suspect at Household

- Collected in closed bin
- Pick up by special officer to transferred to collecting dropping point
- Using special mask bin or special drop box in public area

**#2 Limbah Infeksius ODP Dari Rumah Tangga**

Kumpulkan limbah infeksius yakni masker, sarung tangan & baju pelindung diri

Kemas dalam wadah tertutup yang diberi label "Limbah Infeksius"

Limbah diangkut petugas & dimusnahkan pada pengolahan Limbah B3

Kementerian Lingkungan Hidup dan Kehutanan



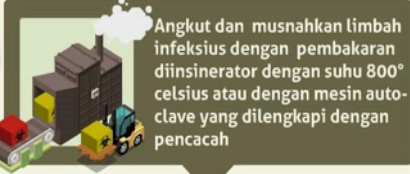


# INFECTIOUS WASTE HANDLING AT HEALTH SERVICE FACILITIES

## #3 Limbah Infeksius dari Fasilitas Pelayanan Kesehatan (Fasyankes)



Limbah Infeksius hanya bisa disimpan maksimal selama 2 hari dalam wadah tertutup



Angkut dan musnahkan limbah infeksius dengan pembakaran diinsinerator dengan suhu 800° celsius atau dengan mesin auto-clave yang dilengkapi dengan pencacah



Residu hasil pembakaran diserahkan ke pengelola limbah B3

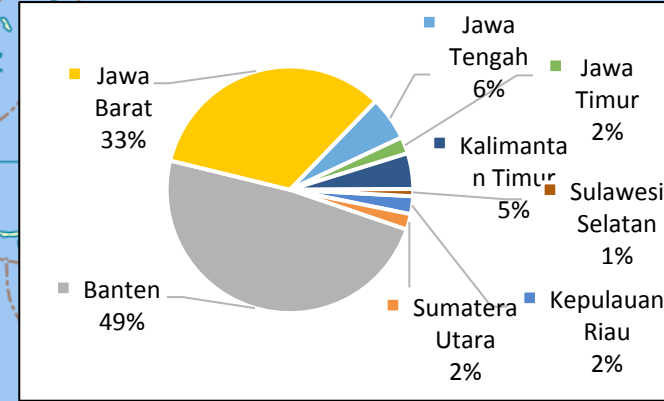
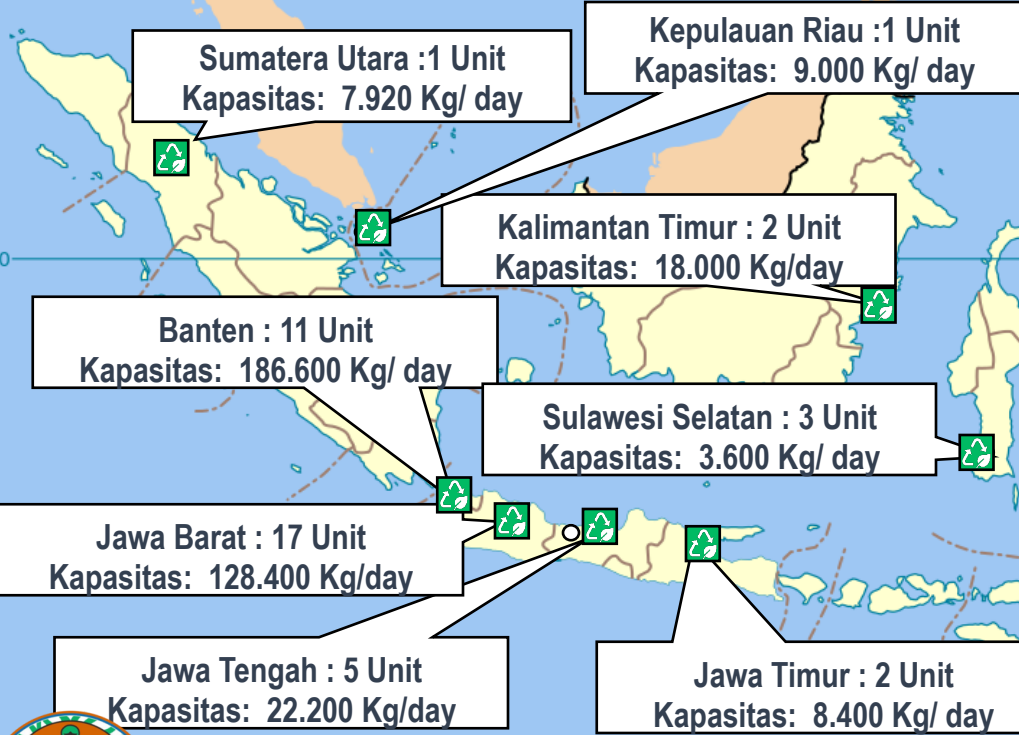
1. Segregating and specific collecting bin for infectious waste COVID-19
2. Spraying disinfectant before moving the bag;
3. Affixing of the symbol on the outside of special infectious containers and the label “Dangerous - do not open”;
4. Regularly spraying disinfectants for Specific container of infectious waste;
5. Handling disposal to the closest waste treatment (preferably in a hospital). Another option is to medical waste treatment services. During pandemic covid-19; treatment of covid infectious waste can be done with an incinerator with a minimum temperature of 800oC or autoclave with a shredder;
6. The residue after insineration should be treated then can be placed in the sanitary landfill with the approval of the local government.

# STATUS OF HANDLING INFECTIOUS WASTE COVID-19 HAZARDOUS WASTE TREATMENT'S SERVICES

Source: PKPLB3-KLHK, Januari 2021

**20 Treatment Services with Total Capacity: 384.120 kg/ day**

Assumption: 100% for medical waste not deal any other type

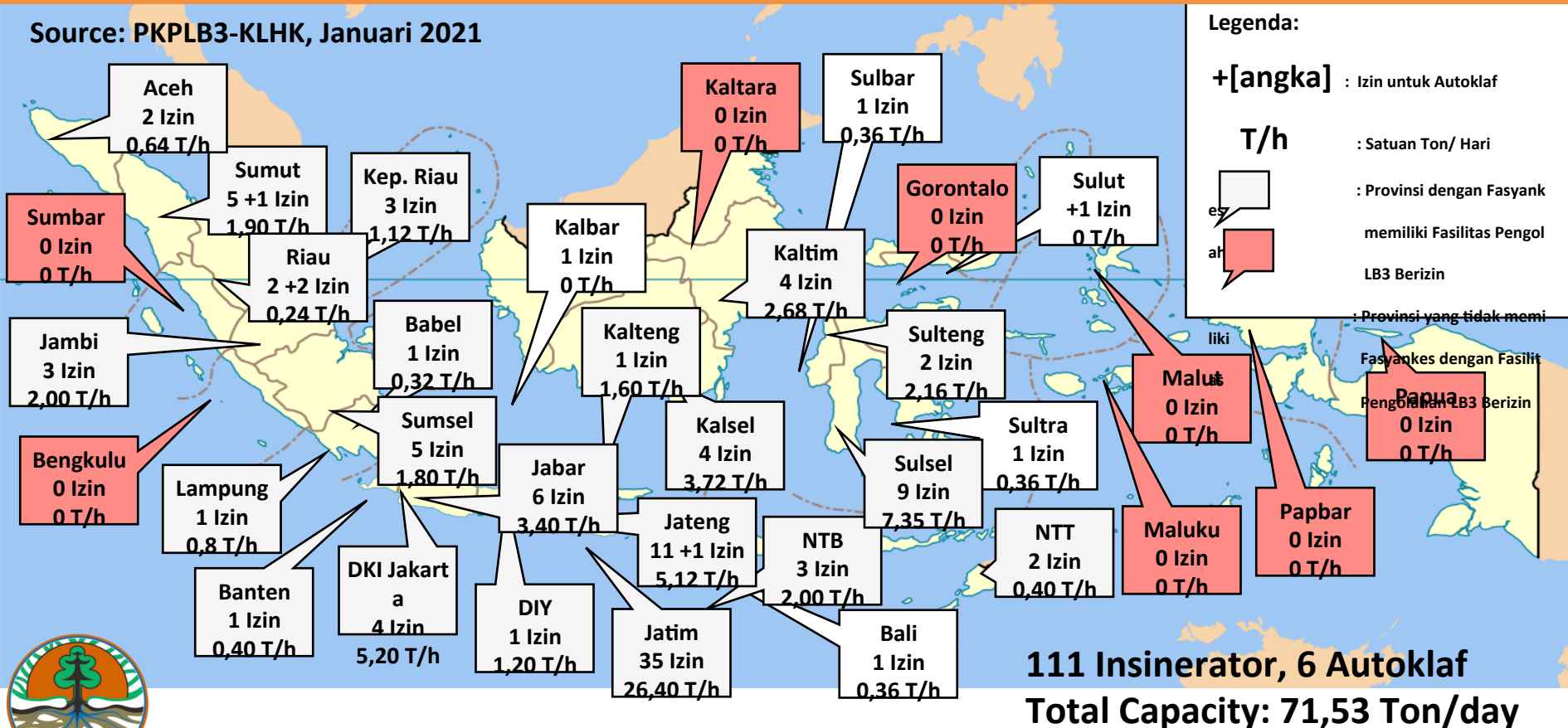


Medical Waste from Health Facilities Services (kg/day)	
- Medical Waste (Min of Health)	294.660
- Covid Waste (increase 30%)	88.398
Estimation total during pandemic covid-19	383.058



# STATUS OF HANDLING INFECTIOUS WASTE COVID-19 HOSPITAL'S INSINERATORS

Source: PKPLB3-KLHK, Januari 2021



**111 Insinerator, 6 Autoklaf**  
**Total Capacity: 71,53 Ton/day**



# MOEF'S MEDICAL WASTE INSINERATOR FACILITY - 2020

**Prov. Aceh**  
Capacity:  
300 kg/jhour



1



**Kab. Barito Kuala,  
Kalimantan Selatan**  
Capacity: 150 kg/hour

3

2

**Prov. Sumatera Barat**  
Capacity: 300 kg/hour



**Prov. Nusa Tenggara Barat**  
Capacity: 300 kg/hour

4

5

**Prov. Nusa Tenggara Timur**  
Kapasitas: 150 kg/hour

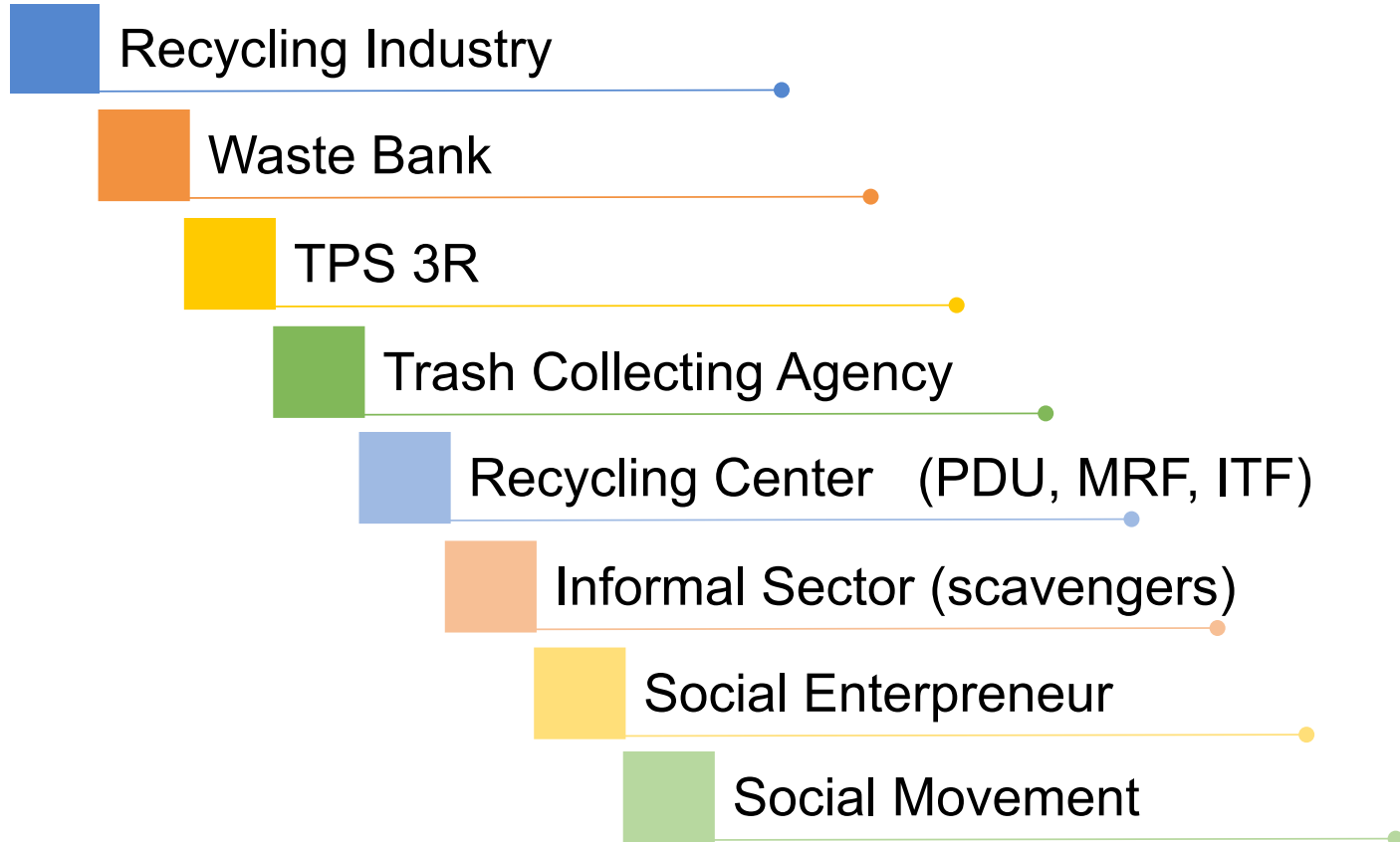


<https://youtu.be/zjkeiCtNAzQ>





# CIRCULAR ECONOMY PROGRAM



# Challenges on Circular Economy on Solid Waste Management

Implementation of policies and regulation and law enforcement

Strengthening local, national & international cooperation

communities-base responsibility approach & public campaign

Incentive fiscal for

- *recycling industry*
- domestic waste recycling
- *recycle facilities*

## SWM Improvement:

- Pilot Project
- DAK Allocation
- DID Plastic Waste Reduction
- Green Infrastructure
- Capacity Building
- Recycling Facilities Support
- Landfill Infrastructure Support
- Technical Assistant
- Monitoring & Evaluation through A dipura Program
- Technology & Innovation
- Research & Development
- Rewarding

## PRODUCER AND INDUSTRIES:

- Reducing import Scrap (paper, plastic)
- increasing of domestic recycling rate on domestic waste as recycling resources
- Single-use plastics & packaging waste reduction from retail sector
- Single-use plastic & packaging waste reduction from brand owner sector
- Single-use plastic & packaging waste from food & beverage service sector



# Challenges on Medical Waste Management



MoEF Medical Waste Facility  
at Labuan Bajo, NTT

1. The availability of medical waste treatment facilities are concentrated on the island of Java, whereas outside java are very much needed.
2. Vaccine medical waste in the form of syringes has the potential to be processed by recycling using syringe fuser technology.
3. Non Covid19 Waste such as Masks from households has the potential to be recycled as plastic raw materials, but this needs to be considered technical technology for recycling; as well as, considering the safety and safety aspects of human health and the environment.
4. MoEF encourages Provincial / Regency / City Environmental Service Offices to be able to tackle covid-19 waste management in collaboration with the local Health Service / Task Force.
5. Partnerships with various parties need to be developed :
  1. to improve Communication, Education and Information (IEC) of Covid-19 waste and
  2. To assist health service facilities dealing with covid-19 waste or general medical waste.



## Further Information:

Directorate General for Solid Waste, Hazardous Waste  
, and Hazardous Substance Management  
Manggala Wanabakti Building Block IV 5F  
Jl. Jenderal Gatot Soebroto Jakarta 10270  
Tel: +62 21 5704501 Fax: +62 21 57902750



**less plastic**  
**more (fun)tastic**

